

ABSTRACT

An optical apparatus having a vertical light receiving element is disclosed. The optical apparatus is configured to couple light generated from a light source using the vertical light receiving element, then transforms the received light signals into an electric signal. The optical apparatus includes: a vertical photo detector having a photo-absorption layer; and an optical bench on which the photo detector is disposed. The optical bench having a first groove and a second groove formed adjacent to each other, the first groove having a predetermined inclination and being formed at an edge of a first surface of the optical bench, and the first surface being opposite to a second surface of the optical bench, on which the photo detector is disposed, such that a light signal incident to the first groove is refracted at a predetermined angle by the first groove; and the light signal, which has been refracted by the first groove, is totally reflected by the second groove. As a result, that the light signal is substantially and vertically incident into the photo-absorption layer.